

A  
PROBATIONARY ESSAY

ON THE

**ARCH OF THE AORTA,**  
AND GREAT BLOODVESSELS ARISING FROM IT;

SUBMITTED,

BY AUTHORITY OF THE PRESIDENT AND HIS COUNCIL,

TO

THE EXAMINATION

OF THE

**Royal College of Surgeons of Edinburgh,**

WHEN CANDIDATE

FOR ADMISSION INTO THEIR BODY,

IN CONFORMITY TO THEIR REGULATIONS RESPECTING THE

ADMISSION OF ORDINARY FELLOWS.

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BY

**WILLIAM FERGUSSON, SURGEON.**

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TO

**J. W. TURNER, Esq.**

PROFESSOR OF SURGERY TO THE ROYAL COLLEGE OF SURGEONS,  
EDINBURGH ;

THIS ESSAY IS DEDICATED,

WITH ADMIRATION AND RESPECT,

BY HIS GRATEFUL FRIEND AND PUPIL,

THE AUTHOR.

TO

J. W. TURNER, Esq.

THAT SEEN OF SURGERY TO THE ROYAL COLLEGE OF SURGEONS

LONDON:

THIS ESSAY IS DEDICATED

WITH ADMIRATION AND RESPECT

BY HIS GRATEFUL PUPIL AND PUPIL

THE AUTHOR



TO

**ROBERT KNOX, Esq.**

LECTURER ON ANATOMY,

EDINBURGH;

THIS ESSAY IS DEDICATED,

AS A SMALL TRIBUTE OF ESTEEM AND RESPECT,

BY HIS FRIEND AND PUPIL,

**THE AUTHOR.**

TO

ROBERT KNOX, Esq.

LECTURER ON ANATOMY,

EDINBURGH;

THIS ESSAY IS DEDICATED,

AS A SMALL TRIBUTE OF RESPECT AND GRATITUDE,

BY HIS STUDENT AND PUPIL,

THE AUTHOR.



# REMARKS

ON THE

## ARCH OF THE AORTA, &c.

IN selecting a subject for a paper of this sort, which I knew was to come before a body of men, eminent for practical knowledge in their profession, I felt considerable difficulty in deciding upon its nature in consequence of the very limited experience which I have had in the ordinary duties of a medical man. From the tenor of my education, however, I felt that I might still have an opportunity of speaking from personal knowledge ; and on reflection, I perceived that if there was one point in the human body more interesting than another, to the anatomist and pathologist, it was the situation and appearance of the Arch of the Aorta and great blood-vessels arising from it, either in their healthy or diseased appearances. Having been connected for nearly four years with a great Anatomical Esta-



blishment, and for a considerable period of that time taken an active share in its management, I have consequently had many opportunities of examining the anatomy of that part of the body to which this paper applies, and having had, by good fortune, several opportunities of examining the bodies of those who had died of aneurism of the arch of the Aorta, I felt assured that I could speak with some confidence on these matters, and therefore determined that such should be the subject of this paper. In addition to these cases of my own, I shall illustrate my remarks on this subject by several valuable preparations in the Museum of the Royal College of Surgeons, to which I have taken the liberty of alluding.

It is not my intention to enter minutely upon any of the subjects herein treated of, as these are matters by far too extensive and interesting to be confined within the limits of an Essay of this nature ; and I shall reserve it for a future occasion to describe, under a more comprehensive form, the various irregularities and affections to which these great and important bloodvessels are liable : objects of interest as well to the anatomist and physiologist, as to the general practitioner in medicine.



Before pointing out the peculiar origin and distribution of the great arteries arising from the arch of the Aorta, which, from their particular course, and relative situation, demand the attention of Surgeons, and in order that we may understand the seat, nature, and external appearance, of the disease to which the following paper in part relates, I shall first describe the natural origin and disposition of this great bloodvessel, and of the important arteries that arise from it.

The Aorta takes its origin from the base of the left ventricle of the heart, a little towards its right side, by an orifice which, in the healthy adult subject, is generally about three-fourths of an inch in diameter. The artery, in the first part of its course, passes almost directly upwards, inclining slightly towards the right side; it continues in this course for the distance of more than two inches, and then it suddenly changes its direction, passes backwards and towards the left side in a horizontal course, and running thus for the distance of nearly two inches, it again quickly alters its direction, and, still passing more towards the left side, dives downwards and backwards, and ultimately gets close upon the left side of the vertebral column.



When the Aorta leaves the heart, it is nearly opposite to the fourth dorsal vertebra, and when it first comes in contact with the spinal column, it is opposite to the third dorsal vertebra. Throughout this part of its course, it generally receives the name of the Arch of the Aorta, and, for the convenience of description, it has sometimes been divided into three distinct portions; which arrangement I shall follow, as it seems to be best adapted for facilitating a correct anatomical description of this part of the body. The first part of the artery, tracing it from the heart, is called the ascending portion, the upper part of the arch is termed its transverse, and that part which passes downwards and backwards is termed the descending portion. The commencement of the Aorta cannot be seen without a particular dissection, being here closely surrounded by the neighbouring parts. Immediately as it springs from the heart, we find within it three projecting folds of the inner membrane of the ventricle and artery which are termed the Sigmoid or Semilunar Valves, and just above or behind these valves, the three pouches or sinuses of MORGAGNI, and in two of these we find the openings of the coronary arteries. The semilunar valves and sinuses of



MORGAGNI are best seen when the artery has been filled with injection, when the valves have performed their proper function, viz. that of preventing the passage of fluid from the artery into the ventricle\*, and when all the neighbouring parts have been clearly dissected away. In the first part of its course the artery may be said to lie within the pericardium, and we can only see it by cutting open that membrane. For the distance of nearly two inches from the heart it is closely connected with the serous portion of the pericardium, as it is reflected from the fibrous layer of that membrane downwards, to form the outer covering of the heart. The part where the membrane comes thus closely upon the aorta can always be readily seen, and just at this point there is a kind of triangular space left, nearly surrounding the artery, where the serous leaves the fibrous layer of the pericardium, and where that layer is becoming continuous with the cellular membrane on the outer part of the blood-vessel, or at all events becoming exceedingly indis-

\* In the injection of a body from the Abdominal Aorta, the force used is commonly sufficient to rupture these valves, but sometimes they withstand it, and then we have the appearance here described.

tingent, and losing the strong fibrous character which it distinctly has when enclosing the heart. In this part of the course of the aorta it will appear to project from the centre of the heart, in front it is covered at its commencement by the pulmonary artery, which, passing upwards, gets upon its left side : to the right, we have the right auricle, and a little higher the vena cava superior ; and on the left and posterior part we find the left auricle, which is closely connected behind to the artery. The pulmonary artery so completely covers the aorta at its origin, that, before the coronary arteries can be properly exposed, it is necessary to cut away this vessel.

Soon after the aorta gets free of the pericardium, it forms the upper part of the arch, or what is termed its transverse portion. From the convexity of the arch we find arising the three great bloodvessels viz. the Arteria innominata, the left Carotid, and left Subclavian, whose particular origin, course, and varieties, it is partly the object of this paper to point out ; and at its inferior side or concavity, about half an inch after the subclavian of the left side has passed off above, we find attached the ligamentous cord, the remains of the ductus arteriosus. This cord is attached to the aorta, just where it is passing down-



wards to form what is termed its descending portion, and where it is gradually passing in between the layers of the pleura of each side of the thorax, which form the posterior mediastinum.

The arch of the Aorta has its concavity looking downwards, and towards the right side; and under it we find many important parts which well deserve the attention of the anatomist, and of him who ever hopes to give a proper diagnosis of many of the diseases to which this part of the body is liable, and which, from their obscurity, baffle even the most experienced in the profession. Proceeding from before backwards, we first find the Pulmonary artery, where it divides into its two great branches, one passing under the arch behind the ascending portion of the Aorta, to get to the right side of the thorax, and the other passing to the left before the descending Aorta, towards the lung of the same side. Behind the Pulmonary artery, and immediately under or rather towards the right side of the arch, we have lying the termination of the trachea, as it is dividing into the two bronchi, and the left bronchus passing under the arch to reach the corresponding lung; and behind the division of the trachea, we find the œsophagus passing downwards to the stomach, getting

more to the left of the mesial plane of the body, and in this part coming almost in close contact with the descending Aorta. On the fore and left side of the arch, where the descending portion commences, we find the Pneumo-gastric nerve of the same side giving off its recurrent branch, which may be traced up behind the Aorta in its course towards the larynx.

All these parts are intimately connected to one another by cellular substance, and here, also, will be found many of the bronchial glands, and numerous twigs of nerves, filling up, as it were, the spaces at the divisions of the trachea and pulmonary artery.

It is well to be aware of the situation of these glands, as they are sometimes subject to such an enlargement as to produce the most urgent and fatal symptoms; and in one instance, I have been informed by an experienced practitioner, that he lost his patient in consequence of an enlargement of one of these glands, which pressed so much against the inferior part of the trachea and on the bronchi, that he actually died of suffocation. Before death, the patient, a strong robust man, in the vigour of life, was supposed to labour under violent inflammation of the lungs, and treated accordingly, but it was only upon dissection that the real cause of death was discovered.



The Aorta before it bends backwards to form the transverse portion, comes pretty close upon the sternum, and is separated from it only by an interval of about half an inch ; although this distance will be found greater or less, according to the size of the vessel, even in a state when it is considered healthy. The distance between the sternum and artery is always greater in proportion, in the young person than in the adult, and will gradually diminish as the person advances in years. In the young, the thymus gland intervenes between these two parts, and in the adult, we have occasionally the remains of that body.

This part of the artery where it comes so nearly in contact with the sternum, may be said to lie in the anterior mediastinum, or, at all events, to be only separated from that part by loose cellular substance.

The transverse portion of the arch lies between the pleura of each side, and in the upper part of the space, which is sometimes termed the middle mediastinum. It will generally be situated about an inch and a half below the upper margin of the sternum ; but in some cases will be found much higher ; and in lean persons, the effects which its pulsations

have upon the neighbouring parts, can be distinctly observed in the undulating motion which it gives to the parts situated at the root of the neck. Hence the danger of deep wounds at this part of the body, even should they miss any of the large arteries. Dr KNOX, in his Lectures on Anatomy, whilst describing this part of the body, makes the following observation :—

“ I remarked, whilst in Caffraria, that the savage inhabitants in their frequent encounters with the colonists, and with the British troops, attempted almost uniformly, when the action became close and hand to hand, to stab our men high in the chest, and, if possible, immediately above the sternum. On one occasion, I observed that they had not only stabbed the men in the neck, but had even removed a large irregular portion of the soft parts immediately above the manubrium of the sternum. The student will readily observe from the dissection of the parts now before him, that this could scarcely be done without cutting out a portion of the trachea, gullet and great bloodvessels, both veins and arteries lying in close contact with these tubes.”

In the Museum of the Royal College of Surgeons, there is a preparation (marked XII. M. 37.),



taken from a man who fell upon a spike, which entered at the root of the neck, and wounded the Aorta, even within the pericardium.

The descending portion runs nearly parallel with the vertebral column, as it will be remembered that here the third and fourth uppermost dorsal vertebræ incline backwards, in order to enlarge the cavity of the thorax. The artery, however, gradually passes nearer to the spine, and generally gets close upon the left side of the body of the third dorsal vertebra, after which it receives the name of the Thoracic Aorta \*, although the term may be applied with equal propriety to that part which we have been describing.

Having thus pointed out the situation and course of the arch of the Aorta, in what may be considered its natural state, I shall now proceed to mention the origin and course of the three great bloodvessels which arise from it.

The Coronary arteries of the heart are sometimes described as arising from the arch of the Aorta, but, as these vessels do not come under the scope of this paper, I shall not speak of them further.

\* Might not this part of the vessel be called the Mediastinal Aorta ?

About three-fourths of an inch from the place where the Aorta emerges from the pericardium, we generally meet with the Arteria innominata, which arises on the fore and right side of the trachea close upon that tube, and passes upwards and slightly backwards, inclining more and more towards the right side of the trachea, from which it is at last separated for a small space. Following this course for the distance of about one inch and a quarter, it divides, nearly opposite to the first rib, into its two branches, the Subclavian and Carotid arteries of the right side. Tracing the arch a little further onwards, we find the left Carotid arising generally about half an inch from the Innominata, on the left side of the trachea, and also close upon it, passing upwards and slightly outwards, to emerge from the thorax at the left side of the trachea. A little further on, and commonly as the aorta passes downwards to form the descending portion, we find given off the left Subclavian artery, lying close upon the pleura of the same side, and running in a nearly vertical direction, parallel with the left Carotid, until after emerging from the thorax, it passes horizontally outwards in its usual course between the scaleni muscles. This artery (I mean the part of



the vessel included between its origin and the tracheal side of the scaleni muscles) varies in its length according to the part of the aorta from whence it takes its origin: it may, however, generally be about two inches.

The Arteria innominata in the course described, has on its left side the trachea, on the right side, and partly in front, the Vena innominata of the same side, directly in front the left Vena innominata; is separated from the sternum by this vein, and by the inferior attachments of the sterno-hyoid and thyroid muscles; posteriorly it is separated from the vertebral column by cellular substance, and by numerous twigs of nerves; moreover, we find it closely encircled by small branches of nerves from the sympathetic ganglia of the neck, which pass downwards to form part of the cardiac nerves.

The left Carotid, in the situation mentioned, has on its right side the trachea, on its left the Subclavian; in front the left Vena innominata, and behind it, is separated from the spinal column by the œsophagus, as it projects to the left behind the trachea, and by nerves and cellular substance; and also we have between the artery and vertebræ the thoracic duct, as it is passing upwards, in its usual course, to join the Subclavian vein.

The left Subclavian behind is nearly in contact with the vertebral column; in front it is covered by cellular substance; to the left it lies in close contact with the pleura; on the right we have the Carotid artery, and between it and the last mentioned vessel we find the Pneumo-gastric nerve of the left side, as it is about to pass in front of the aorta at the part already mentioned.

The aberrations from the usual origin and course of these great bloodvessels, may be divided into two heads, as they are interesting either in a physiological or surgical point of view. It is to the latter that I shall confine my remarks, the former being by far too extended a subject, and one which would require more than the limits of this paper permit, to enumerate and describe the many remarkable deviations from the natural position of these important and interesting arteries.

The most frequent irregularities that I have seen have occurred in the Arteria innominata; and the most common is that in which this artery arises from the arch, in front of the trachea, or even to the left side, having to pass across it in order to get to its usual situation. The artery in this case is sometimes shorter than usual, but



more frequently it is longer. In my dissections during the course of one winter, I have met with this variety in no less than six cases. In those instances in which the artery was short, it seemed to me to be little endangered by the usual operations on the trachea ; but I always found, as might be expected, that the subclavian was longer than usual on the tracheal side of the scalenus muscle. When the artery was long, it passed up in front of the trachea, above the upper margin of the sternum, and, in such a case, I have no doubt, might have been felt pulsating during life. I have frequently seen an oblique groove, or indentation, on the surface of the trachea, which was evidently formed by the Innominata passing in the course just described.

It is principally on account of the operation of tracheotomy that the surgeon pays attention to the situation of the great bloodvessels at the root of the neck ; as when any of these arteries run across the trachea, above the manubrium of the sternum, there is danger of wounding some of them ; an accident which assuredly would prove immediately fatal. Hence a good rule for operating on the trachea at this part has been inculcated by surgeons,—that the incision should always be from below upwards, and

that the fore-finger of the operator's left hand should be placed on the trachea between the back of the knife and upper part of the sternum. In one subject which I dissected, an enlargement of the right lobe of the thyroid body existed, the Innominata was longer than usual, the lower part of the tumour lay in close contact with it, and, even in the dead subject, could only be separated from it by the most careful dissection.

Although this particular course of the Innominata is to be dreaded by the surgeon in some cases, yet in others, when known to be present, it may be hailed as a circumstance alike favourable to himself and the patient. I allude to those rare cases in which it is deemed expedient, in order that the patient may have a chance of life, to put a ligature upon this vessel. When such is the situation of the parts, it will be evident that the operation can be done with greater ease by the surgeon, with much less actual risk on the part of the patient, and without so much of the unavoidable disturbance to the neighbouring parts, which must always occur when the artery lies in what is called its natural situation.

Another variety with regard to the Innominata is,



that in which we find three great arteries arising from it, one of these being the left Carotid. I lately met with an instance of this irregularity in the dissecting rooms. The left Carotid arose from the Innominata, about the middle, between its origin and division. The preparation is now in Dr KNOX's Museum, and there are several of the same kind in the Museum of the Royal College of Surgeons.

When this variety exists, the artery runs across the front of the trachea to get to its usual situation, and might be wounded in performing tracheotomy. It would also be endangered in the operation of œsophagotomy, and reminds the surgeon how careful he should be in this operation, independent of the caution required to avoid this artery in its natural situation.

Another variety connected with the Innominata, is that in which we find a small branch given off from the middle part of this vessel, passing up towards the thyroid body, close in front of the trachea. The artery in this course may either pass upwards as a single trunk, or, previously to arriving at its destination, divide into several branches. In either case, it will require all the surgeon's care to avoid opening it in his operations on the trachea.

Mr HARRISON, in his work on the Arteries \*, says, that so frequent is this distribution, that he is in the habit, during his Lectures, of describing this vessel as the middle thyroid artery. The same branch, he also remarks, sometimes arises from the arch of the Aorta; and, during last winter, I myself saw an instance of this nature, where the artery passed as a single trunk to the thyroid body.

Mr HARRISON seems to have seen this distribution more frequently than any writer with whose works I am acquainted. TIEDEMANN, who has dissected upwards of 500 bodies, investigating the anatomy of the arteries, mentions, in the description of his plates, that he has met with this variety only in one instance, which he delineates, showing the artery, dividing in front of the trachea into two branches, which pass up, in a tortuous direction, to the thyroid body.

The same author, in his Plates of the Arteries, gives many delineations of preparations, in which the Innominata is altogether wanting, where the right Subclavian arises by a single trunk from the Aorta, at the commencement or termination of the

\* Vol i. p. 15.



transverse portion of the arch, and passes, according to its origin, either in front or behind the trachea to its usual situation.

In such cases as these, did the surgeon attempt to put a ligature on the Innominata for disease of the Subclavian, he would be much mortified, on tracing the Carotid downwards, to find no Innominata present.

One of these varieties appears to me of more interest than the others, viz. that in which the right Subclavian arises from the left side of the arch, and crosses to the right between the trachea and gullet; for, in this situation, the artery may affect the respiration of the individual, and will most certainly be affected during deglutition \*. Mr HARRISON, in his work (vol. i. p. 12.), mentions a remarkable case, in which this artery, taking the above course, was wounded by a fish-bone, which passed through the œsophagus, and occasioned death.

There are many curious and interesting devia-

\* The converse of this has been maintained by several physicians, who relate that deglutition has been impeded by this irregularity; and they describe from thence a new kind of Dysphagia, which they term *Lusoria*.

tions from the natural origin of the bloodvessels from the arch of the Aorta ; but those above quoted seem to me the varieties in distribution which more particularly merit the attention of the surgeon.

Of all the changes from natural appearance, which the arch of the Aorta presents, the dilatation it undergoes in old subjects particularly, is by far the most common. Indeed, in almost every subject advanced in years, that portion of the arch, which is covered by the serous layer of the pericardium, is found more or less enlarged ; so that it has actually been described by many anatomists as the healthy appearance, and by them been called the great sinus of the aorta.

I have frequently observed this appearance, which can scarcely be considered a diseased state ; it appears to me, to form one remarkable exception, and the only one with which I am acquainted in the body, to that general law with regard to the arterial system, that all arteries between the giving off of two large branches, preserve the same diameter throughout ; whereas the Aorta, after its origin from the heart, gradually contracts, until it arrives at the part where the arteria innominata is given off. This peculiar appearance may be considered, however, as in a state approaching to disease, and then cannot



be thought of in the view above taken. I have frequently seen this dilatation, and it has often been remarked to extend throughout the whole arch.

The Aorta within the pericardium is subject to aneurism, which generally terminates fatally, by bursting into that cavity. Of this there are many instances on record; and I have myself had occasional opportunities of dissecting such cases.

The Aorta here is also subject to inflammation and softening, which, in several cases, seem to have been the consequences of external violence. After receiving the injury, the person may live for many days, but never feels himself altogether well. He suddenly drops dead; and, upon dissection, the pericardium is found distended with blood, which has passed through a small opening in the Aorta, the effect apparently in part of ulceration, and in part of the impulse of the blood through the Aorta, causing a rupture of the external coat, when the other coats have been thinned by ulceration, and softened by the previous and existing inflammation.

There is a preparation in the Museum of the College of Surgeons (marked XII, 1127.), which illustrates the foregoing remarks. It is a specimen of dilatation and rupture of the ascending portion

of the arch within the pericardium. The inner coats are destroyed by ulceration, and the outer serous membrane has burst, being no longer able to sustain the force of the blood passing along. The body was dissected by Dr KNOX, and the preparation presented by him to the Museum.

This case may be considered as one in which external violence acted as the primary cause of the affection. The gentleman, from whose body it was taken, was about thirty years of age, and had always enjoyed the most robust health. He was pitched with great violence out of a gig, never felt well from the time of the accident, and, about a month afterwards, suddenly expired.

I have heard of several instances, although not acquainted with the particulars of the dissections, where, after external violence, the persons have died suddenly ; and, judging from the case above mentioned, we are entitled to expect a like appearance on examination.

Towards the end of last winter, Mr BAIN, Surgeon, a pupil of Dr KNOX's, requested that gentleman to assist him in the examination of the body of a person who had died very suddenly. The cir-



cumstances attending this case, as related by Mr BAIN, were as follows :

“ A gentleman, about thirty-five years of age, and who, with the exception of a slight dyspnœa, increased by exercise, had not for many years been unwell, and had never suffered from any serious ailment, went to bed in excellent health, and was found dead early next morning. He was to have been married in a few days.”

The hurry of business prevented Dr KNOX being present at the dissection, and he requested me to accompany Mr BAIN, and ascertain, if possible, the cause of death.

On examination, I found the pericardium much distended with blood, which had made its way through a small opening in the Aorta, behind, and to the left side of the Pulmonary artery. Upon laying open the Aorta, its inner membrane, for the distance of six inches, was found much inflamed, thickened, and softened, and the division between the healthy and diseased portion of the vessel was most distinctly seen, the extent of the disease having a well marked and sudden termination. The outer coat of the vessel within the pericardium was also slightly inflamed. At the root of the Aorta

there was an aneurism the size of a small orange, which projected backwards, where this vessel is not completely covered by the pericardium. The tumour lay under the arch, had pressed upon the trachea and bronchi, and had suddenly burst, in consequence of the ulceration of the inner coats of the vessel, and want of strength in the serous covering of the pericardium. The opening was so near the Pulmonary artery, that, at first sight, it actually appeared to be a rupture of that vessel itself, a circumstance so extremely rare, that I am only aware of the existence of one preparation of the sort \*.

When one reflects on the history of the last mentioned case, it must be apparent how extremely difficult our diagnosis must be in diseases of a like nature, when, as appears in this case, what we would consider as the most distressing circumstance of all, viz. the inflammation of the Aorta, had even escaped the notice of the patient himself, who only complained of a slight difficulty of breathing, which we can

\* The preparation here alluded to is in the Museum of the Royal College of Surgeons in Edinburgh. There is also an instance of rupture of this vessel related by Mr W. GUNN, Assistant Surgeon, R. N., in the Edinburgh Medical and Surgical Journal for January 1829.



now easily account for by the pressure of the aneurismal tumour upon the neighbouring parts. The preparation is now in Dr KNOX's museum ; and, in addition to its value as a specimen of aneurism, is considered by that gentleman as the only pure case of Aortitis that he has ever seen.

In aneurisms of the Aorta, the tumours are commonly connected with the vessel both within and without the pericardium ; and, so far as I have remarked, the rupture, although it may happen into the lungs, trachea, gullet, &c. commonly occurs within that membrane. Of course this observation only applies to those cases which terminate fatally before the aneurisms become so large as to destroy the neighbouring parts, and break through the skin.

I would explain the frequency of rupture within the pericardium, as being the consequence of the outer coat of the artery, at this part, not being capable of such an extension as that portion which is uncovered by the pericardium ; and for preparations illustrative of this observation, I may refer to those marked XII. 2. M. 1., XII. 873. and 484., in the Museum of the Royal College.

When aneurism of the Aorta is connected with that part of it which is covered by the pericardium, the disease may prove fatal before it is well deter-

mined what is the matter, and even before the medical man is consulted.

To shew how careful a practitioner should be in not altogether neglecting a patient's account of his own symptoms, I may mention the following case. The late very celebrated Dr. GREGORY was consulted by a man of middle age, who was a tailor by trade. He gave such a confused description of his ailment, that the Doctor, taking into account the occupation of the individual, and setting him down as a hypochondriac and dyspeptic (a class of patients for whom he was well known to have little sympathy), ordered him to go home, and desired him never to trouble him again. The tailor, however, still felt ill, and again presented himself to Dr. GREGORY, who treated him in his former style. The man walked home, and, as his wife opened the door, fell dead upon her shoulder. Upon dissection, a small aneurism was discovered within the pericardium, which had suddenly burst.

Those cases of aneurism of the Aorta which attain a considerable magnitude, are almost always connected with the vessel, after it has passed through the pericardium, a little before the giving off of the Arteria innominata. Here the structure of the ves-



sel differs from that portion nearer the heart, in so far that it wants the serous covering which it receives from the pericardium, and, moreover, admits of much greater dilatation than that part of the artery.

From the situation of the arch, we can easily perceive how soon aneurisms, when they enlarge, will affect the neighbouring parts, and how soon they will come in close contact with the sternum, and appear at the root of the neck.

There are several examples of aneurism at this part of the Aorta in the Museum of the Royal College, and some of these beautifully illustrate the effect which the tumour has upon the contiguous parts. There is one in particular of an exceedingly large aneurismal tumour occurring before the giving off of the Innominata, where the Aorta, in the after part of its course, appears quite natural, although from the tumour to the heart the artery is considerably enlarged. Part of the sternum, the sternocostal cartilages, and portions of the ribs on each side, have completely disappeared.

Mr ALLAN BURNS, in his *Surgical Anatomy of the Head and Neck*, mentions (p. 69) the dissection of a very interesting case of aneurism of the arch of

the Aorta, which included a part of the Innominata. It illustrates how an aneurism at this part may sometimes be mistaken for one connected with the great vessels at the root of the neck. The sac did not swell out into a rounded shape, as is generally the case, but passed upwards in an oblong shape, and projected above the clavicle, at the outer side of the sterno-cleido-mastoid muscle.

On considering the cases that have come under my observation, and comparing them with what I have read, I am inclined to think that aneurisms of the arch of the Aorta occur more frequently in the ascending portion than at any other part of the vessel. We have, however, dilatation and aneurism of the transverse and descending portions, although, as I have stated, not so frequent in occurrence as those found in the artery during the first part of its course. This circumstance we may account for, by supposing that the three great bloodvessels, as they carry off a considerable quantity of blood, lessen the impulse which it has against the sides of the ascending portion of the arch, through which the blood passing to the whole system must first run: but I offer this conjecture with great diffidence, knowing how extremely faulty and imperfect all strictly me-



chanical theories have been, when employed to explain the phenomena of living bodies in a healthy or diseased condition.

I have not had many opportunities of seeing aneurisms of the transverse and descending portions of the arch.

Sir ASTLEY COOPER informed Mr ALLAN BURNS of a case of aneurism occurring in the Aorta between the Carotid and Subclavian arteries of the left side, which, although it happened on that side, somewhat resembled his own case, to which I have alluded above, in the difficulty of at first deciding on the connexion of the tumour, as it was for some time taken for an aneurism of the left Carotid. The tumour originated by a small neck, and gradually enlarged in size as it passed upwards to the root of the neck \*.

Mr ALLAN BURNS, in his paper on aneurism of the arch of the Aorta, remarks, and he has had ample opportunities of deciding, that in aneurism of the ascending portion of the arch, the patients most generally complained of difficulty of breathing, which was greater or less in different instances; and, in some

\* See A. BURNS on the Surgical Anatomy of the Head and Neck, p. 71.



cases, no complaint was ever made until within a short period of the person's death.

In the same paper he mentions, that, when the tumour was connected with the transverse portion, the most distressing symptom was difficulty of swallowing; and to illustrate these remarks, he adduces many interesting cases, taken from other authors, and many which had occurred in the course of his own practice; and I cannot do better than add, in his own words, that “those who know the relation  
“ of the ascending Aorta to the trachea, and are able  
“ to trace the connexion of the Aorta with the œso-  
“ phagus, will anticipate me in the explanation.” Nor can I here help remarking, in bringing to a conclusion this brief and imperfect Essay on some most important anatomical and surgical points, submitted, with deference, to this learned and critical body, how necessary a correct knowledge of the natural situation of every part of the human frame is to the medical man, whether surgeon or physician, who may hope ever to have a correct and distinct idea of the same parts in their diseased state, or as they become affected by the diseases of the contiguous parts.





